



*Transcending Boundaries*

# Exploring the New Vision for America's Energy Economy



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Cover: Petra Nova near Houston, Texas

# Message From the Chairman

The advent of a new Administration at the national level always brings fresh challenges and opportunities for the states. Policy-making, personnel, planning, and budgeting become major tasks and, perhaps, adjustments to a new way of conducting the business of governing.

In concert with the anticipation over the election of a new President and the promises of “Cooperative Federalism” with expanded roles for the states, I am pleased to report that the Southern States Energy Board is experiencing an outstanding year!

“Exploring the New Vision for America’s Energy Economy,” SSEB’s theme for 2017-2018, is certainly in keeping with the events in the energy sector that are unfolding before us. The Southern States Energy Board is playing an exciting role in exploring that new vision.

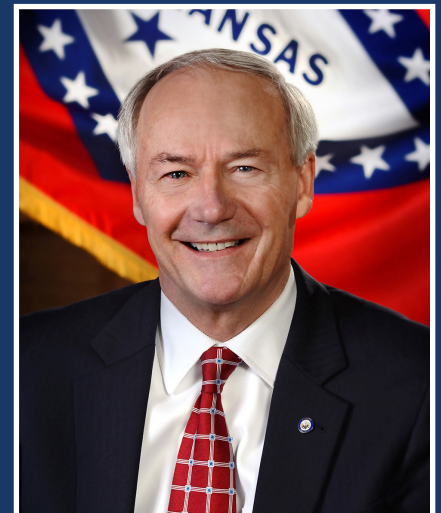
I am honored this year to serve as the Chairman of the Southern States Energy Board and the Interstate Oil and Gas Compact Commission. When I accepted these roles, it quickly became apparent that the two organizations have much in common and also share a long history of working together to resolve complex issues facing the states and the energy industry. With this in mind, I was eager for both organizations to assist in leading a Governor’s Summit on Energy Security and Infrastructure, especially with a new Administration and its plans to recharge and invigorate the energy sector.

During the Governor’s Summit on February 23-24, we heard from governors, industry leaders, technical experts, and academia about our energy future. There was strong emphasis placed on cybersecurity, infrastructure needs, workforce development, and a variety of energy and environmental initiatives underway in our member states. After thoughtful consideration and discussion, a number of ideas were shared on what the southern states can do to promote our cause relative to these issues.

Following the Summit in February, I wrote a letter to the President citing an appendix of key points and recommendations related to:

- (1) infrastructure development, including the establishment of a multidisciplinary process within the federal government to serve as a one-stop shop on federal permitting issues;
- (2) cybersecurity issues, including coordination of government and industry and investments in research and development by the Departments of Defense and Energy and the National Science Foundation into cybersecurity solutions for the energy sector;
- (3) investment in educational campaigns to create

Asa Hutchinson  
*Governor of Arkansas*





the workforce of the energy sector of the 2020s; and (4) a focus on innovation and technology solutions that support traditional fuels such as coal, natural gas, renewable resources, and nuclear power.

Future energy security and international competitiveness depend on the modernization of America's energy infrastructure including the cybersecurity innovations that can protect our networks of production, transmission, storage, and distribution systems. Threats to energy security in the United States emanate from the political instability of energy producing countries, the manipulation of energy supplies, competition among emerging economies, attacks on power plants and supply infrastructure, natural disasters, accidents, terrorism, and reliance on foreign countries for oil resources. Energy security strengthens the performance of all sectors within the American economy.

While the U.S. Department of Energy is working to proactively address cybersecurity issues with technology, readiness, and resiliency, industry needs to engage and participate to maximize federal investments. Protocols should be established for threat information exchange between the various levels of government and an overall awareness of cyber issues from the perspective of the electric grid, oil and gas industries, and communications infrastructure.

Permitting of infrastructure creates bottlenecks, and lines between federal and state permitting should be addressed. At the same time, workforce development issues are coming to the forefront as a large percentage of the current industry personnel is aging. Connecting education from Kindergarten through Doctoral programs is especially important in cyber issues. Finally, innovation is key to future energy production and use.



Today, we have a unique opportunity to impact the smart decisions that will shape the energy sector of our economy for decades to come. America is less dependent on foreign oil than it has been in more than 40 years. Unconventional oil and gas drilling have given us an international lead in the quest for energy independence but we must ensure that the regulatory role of the states is clear and strong. New nuclear power technologies must be pursued and we must make decisions on the safe and permanent disposal of spent nuclear fuel. Renewable energy resources will add to our energy security and create jobs. The future energy sector will depend on the development of a strong, skilled workforce. With the retirement of “baby boomers,” there will be new and expanded job opportunities in the energy field.

This year the Southern States Energy Board celebrates a very special milestone. Since 2003, the Board has served as Manager of the Southeast Regional Carbon Sequestration Partnership (SECARB). In 2011, the Partnership’s Phase III efforts resulted in the world’s first, fully integrated, carbon dioxide (CO<sub>2</sub>) capture and storage, 25 megawatt equivalent (MWe) demonstration project utilizing anthropogenic, or man-made, CO<sub>2</sub> from a coal-fired power plant. The CO<sub>2</sub> was transported 12 miles, from Alabama Power’s Plant Barry near Mobile, Alabama, via a dedicated pipeline to an oilfield in Citronelle, Alabama. Approximately 114,000 metric tons of CO<sub>2</sub> were injected into the deep saline Paluxy Formation for permanent storage.

Investors from NRG Energy in Houston, Texas, visited the demonstration plant and liked what they saw. Scaling up SECARB’s demonstration plant to 240 MWe, NRG and its partners built Petra Nova, which won Power Magazine’s highest honor as the

U.S.’s first and world’s largest commercial post-combustion carbon capture system at a power plant. Petra Nova is recognized with distinction as a globally significant environmental breakthrough and a trailblazing revenue-generating facility. The CO<sub>2</sub> captured at the plant is shipped by pipeline 81 miles to Hilcorp’s West Ranch Oilfield and used for enhanced oil recovery. Prior to Petra Nova, the West Ranch oilfield was producing 300 barrels of oil per day and is expected to reach 15,000 barrels per day with a maximum of 60 million barrels of recoverable oil. Building this billion dollar project on time and under budget—despite a chaotic policy climate and other challenges—was a top priority for NRG’s investors and partners. The SECARB demonstration project was instrumental in plans to scale up and also shortened the time needed for development and construction.

SSEB is leading the way in advancing storage technology for CO<sub>2</sub>. SSEB and research partners across the Southeast are assessing the feasibility of a regional CO<sub>2</sub> storage complex adjacent to the Kemper County energy facility in Mississippi. Three wells have been drilled and cored for use in characterizing and calculating the CO<sub>2</sub> storage potential. Initial results indicate that the location is a world-class CO<sub>2</sub> storage repository for a commercial scale, 438 million metric ton capacity, storage site. At this rate, the complex will have the capacity to receive 3 million metric tons per year of CO<sub>2</sub>, and potentially three times as much as determined by pre-feasibility models, for a period of at least 30 years. In addition, the Board is managing the Southeast Offshore CO<sub>2</sub> Storage Resource Assessment (SOSRA) to develop a high-level approximation of CO<sub>2</sub> storage capability in three

areas—the Mid-Atlantic; South Atlantic; and eastern Gulf of Mexico—utilizing key geologic and environmental factors that influence storage potential.

SSEB continues to maintain a vital partnership with the U.S. Department of Energy on environmental management as well as training and preparedness for radioactive materials transportation. Through the Board's four committees, emergency response and radiological health professionals representing our member states help to implement policies and procedures to ensure shipments traversing the region are conducted in a safe and efficient manner. For instance, prior to the resumption of shipments of radioactive materials to the Waste Isolation Pilot Plant in April, SSEB committee members and staff visited each corridor state as a part of a forum to educate and inform first responders, community leaders, and the general public of the various elements of the shipping program. This effort reinstituted institutional protocols which may have lapsed during the site's two-year closure.

On the commercial front, SSEB maintains the Southern Mutual Radiation Assistance Plan as a mutual aid agreement identifying resources and the mechanism for states to request assistance from one another in the event of an incident at a nuclear power plant. SSEB plays a significant role in facilitating practice drills to ensure proper coordination occurs in the event of an actual incident. In addition, several members of the Board's Radioactive Materials Transportation Committee are conducting extensive analysis of routing issues associated with transporting spent nuclear fuel from commercial reactors to proposed locations for a repository and interim storage facility. These are just a few of the efforts being undertaken in this important arena as SSEB works with our states and the federal government to establish a national strategy for the remediation and disposal of these highly sensitive materials.

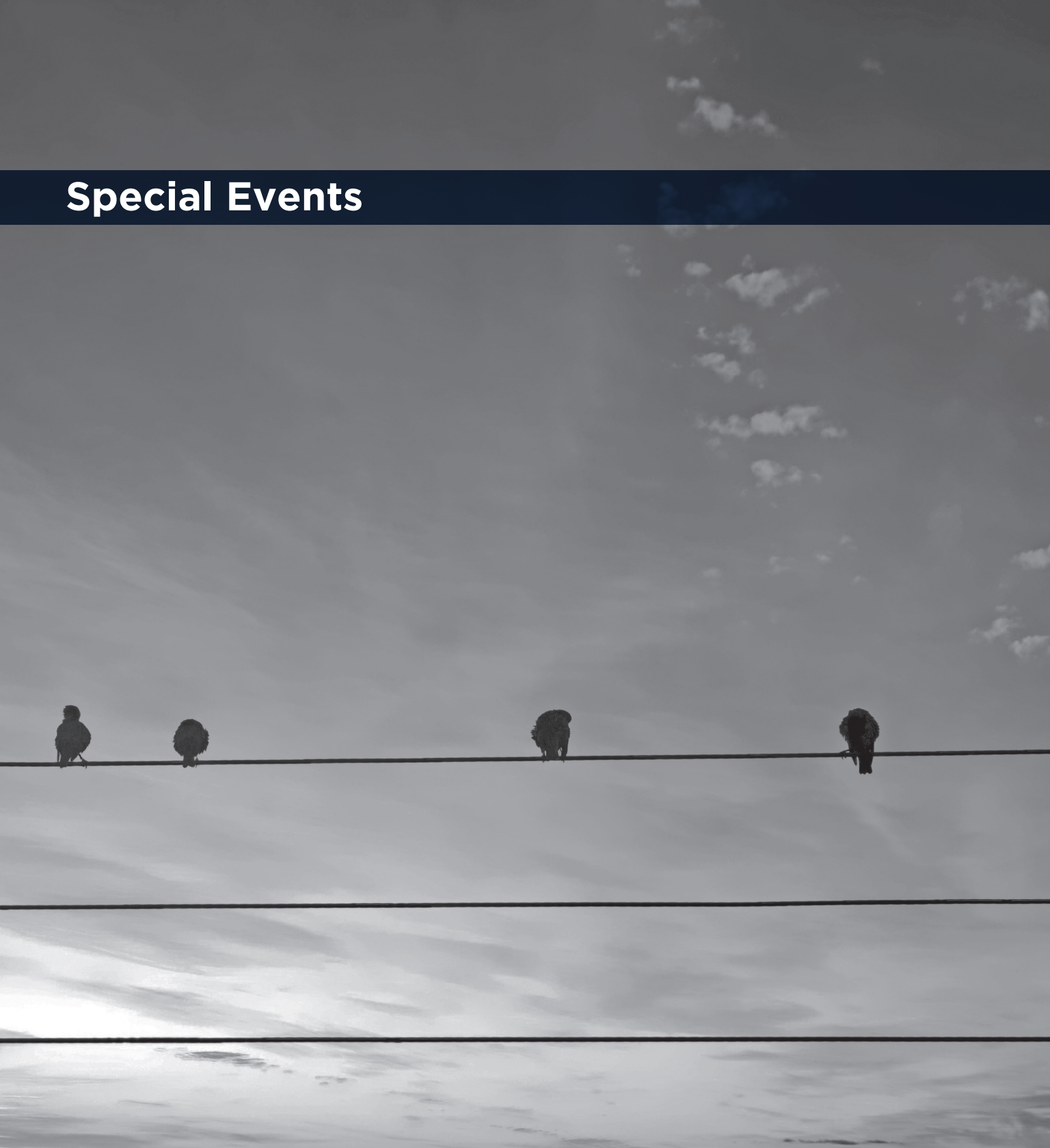
A New Vision for America's Energy Economy is essential if we are to safely manage the energy resources and technologies that can drive a path to a reliable, secure, and low-cost energy future. The Southern States Energy Board, through its unique roles in policy and technology development, is the catalyst that can bring together states and public/private partnerships to enhance the mutual cooperation needed in this new era of "Cooperative Federalism." As Chairman, I commend this 2017 Annual Report to you as a record of the successes and accomplishments of an outstanding regional organization!

A handwritten signature in black ink, reading "Asa Hutchinson". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

**Asa Hutchinson**  
*Governor of Arkansas*  
*Chairman 2015-2017*



# Special Events



# Governor's Summit on Energy Security and Infrastructure

February 23-24, 2017

In 2016 after assuming the Chairmanship of both the Southern States Energy Board (SSEB) and the Interstate Oil and Gas Compact Commission (IOGCC), Arkansas Governor Asa Hutchinson charged the organizations with collaborating and coordinating a Governor's Summit on Energy Security and Infrastructure. The Governor's Summit was held on February 23-24, 2017, in Washington, DC, to coincide with the National Governors Association's Winter Meeting. The event was successful in bringing together the leadership in the states and the energy industry to address the critical energy infrastructure planning and development that is essential to fuel America's economy.

Governors Matt Bevin of Kentucky, Gary Herbert of Utah, and Matt Mead of Wyoming, along with energy experts representing federal and state government, utilities, and universities joined Governor Hutchinson for a well-informed and lively discussion on the current condition of our Nation's energy security and infrastructure. Participants also contributed recommendations for improvements and enhancements that are necessary for energy infrastructure modernization; innovations in cybersecurity to protect our networks of production, transmission, storage, and distribution systems; and initiatives and programs encouraging workforce development to support the jobs of the future in the energy industry; and solutions to other key energy and environmental issues.

On April 11, 2017, Governor Hutchinson sent a letter to United States President Donald J. Trump summarizing the event and offering a blueprint to move the energy and infrastructure sectors forward in the new Administration. In the letter, he urges the President to review the key points and recommendations that emanated from the Governor's Summit.





# Recommendations to the President of the United States:

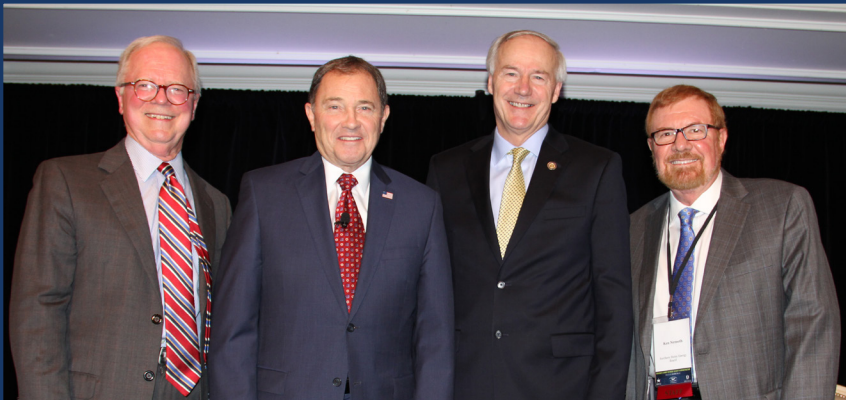
## Infrastructure items

We urge the President to help the Nation unlock more of its energy resource potential by revising the Federal permitting process. Through the creation of a multidisciplinary permitting process within the Federal government that becomes the single point of contact with industry on permitting issues, and reforming the process as indicated below, the industry can proceed with the construction of large projects in a more timely fashion and save consumers money by lowering the costs of infrastructure improvements.

- Permitting for major energy infrastructure and projects at the Federal level is too diffuse. The Federal government needs a single clearinghouse to respond to utility and industry requests, especially if multiple Federal agencies are involved. The culmination of this streamlined process should be a one-stop shop for expedited permitting at the Federal level.
- Permitting is the domain of the State and the Federal governments. Regulatory authority should be clarified in matters such as eminent domain.
- A general reduction in federal regulations is needed immediately including retraction and cancellation of the Clean Power Plan, the Waters of the U.S. rule, and many other mandates created over the past decade.
- Reducing the cost of court interventions during permitting and construction of major infrastructure facilities will save taxpayers money while still ensuring the rights of interveners.

## Cybersecurity Issues

The United States electric grid is increasingly vulnerable to cyber security attacks. In a national emergency, government and industry must work together to plan for resiliency and recovery. We urge the President to immediately consider appointments to three vacancies on the Federal Energy Regulatory Commission to protect utilities, natural gas, and telecommunications. Further, we request that the United



Mike Smith, IOGCC; Gov. Gary Herbert, Utah; Gov. Asa Hutchinson, Arkansas; and Ken Nemeth, SSEB, following a panel discussion on energy infrastructure and modernization and cybersecurity for energy systems.

States Secretary of Energy continue to engage the Electricity Subsector Coordinating Council to ensure government/industry cooperative management of changes and risks, conduct joint exercises, and continue earnest investments in research and development by DOD, DOE, and the National Science Foundation into cybersecurity solutions for the energy sector. The U.S. Department of Energy is working to proactively address issues with technology, readiness, and resiliency following a major cyber-attack. The President should encourage industry engagement and participation, technologically and monetarily, to maximize the security of infrastructure investments.

## **Workforce Development Issues**

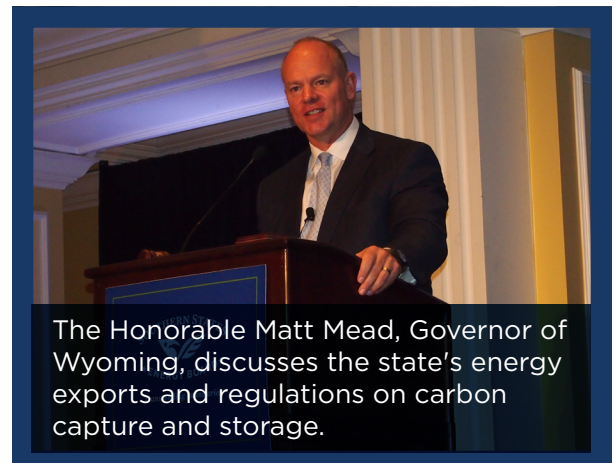
The estimated number of required energy and cybersecurity professionals for the Nation's future workforce is staggering. Put into perspective, the needs easily outweigh America's capacity to educate and train in the next three years. The country needs to invest now in a huge educational campaign to begin to create the workforce of the 2020s.

- The number of cyber professionals required is estimated at over 1.5 million by 2020 (Burley).
- Energy executives and managers average 62 years of age and high-level administrators exceed 65 years.

## **Energy & the Environment Issues**

Pragmatically speaking, the Nation needs a balance of fuel options for its energy needs. This includes oil, coal, gas, nuclear, wind, solar, hydro, and energy efficiency. We ask that the President consider these points:

- Climate vs. energy production is a non-starter question: focus on innovation (e.g., carbon capture and usage); find technology solutions that support coal, gas, and renewables.
- Re-open Yucca Mountain, so that the nation has a long-term solution for used nuclear fuel and waste materials.
- Support existing nuclear power plants and invest in small nuclear reactor development; eliminate ALARA (aka "as low as reasonably achievable") regulations on nuclear.
- Work toward an energy fuel balance (fossil, nuclear, renewables).
- Energy poverty is a demand that the United States can help meet (export coal and LNG).



The Honorable Matt Mead, Governor of Wyoming, discusses the state's energy exports and regulations on carbon capture and storage.



# Governor Hutchinson Announces the Formation of the Governors Energy Caucus

February 24, 2017

At the conclusion of the Governors Summit on Energy Security and Infrastructure on February 24, 2017, Governor Asa Hutchinson announced the formation of a Governors Energy Caucus. “I urge all governors to participate in this new coalition, especially those from energy producing states that have much to gain or lose as new energy policies, regulations, and technologies emerge from the new Administration,” said Hutchinson.

The purpose of the Governors Energy Caucus is to provide a forum for governors of American states and territories to:

- Confront, address and deliberate on energy issues;
- Share information between and among states and territories;
- Request appearance before this body by any person, including members of Congress, the Administration or the public-at-large, who can further the knowledge and interests of this body;
- Meet as necessary with the U.S. Secretary of Energy to discuss the impact of the Administration’s energy policies and the role of the states;
- Appear before Congressional committees, federal forums or industry meetings regarding the interests of the Caucus; and
- Hold an initial meeting to address Caucus leadership and agenda.

States play a critical role in developing and maintaining the Nation’s energy and environmental infrastructure. Energy and cybersecurity are vital to protect us from those who would do harm to energy and environmental facilities that are the lifeblood of America. We must educate and train workers to think innovatively; to operate new and more efficient technologies; and to expand an aging energy industry workforce that is critical to our future economic development and sustainability. To reach these goals, Governor Hutchinson encouraged participants to support our new President and use the power of the states to move new energy projects forward through efficient and effective energy regulatory measures that can help us to achieve true American energy independence.

The Southern States Energy Board and Interstate Oil and Gas Compact Commission were designated to coordinate the staffing arrangements necessary to serve the needs of the Governors Energy Caucus. The Second Governors Energy Caucus will convene during the SSEB’s 57th Annual Meeting in September 2017.

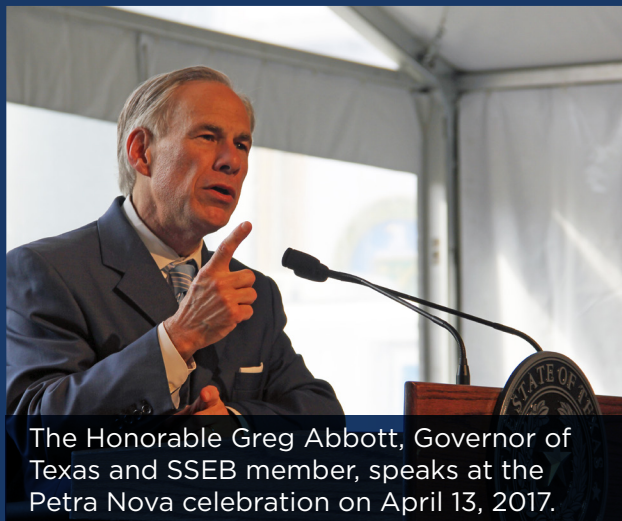
# Celebrating Petra Nova

## SSEB's SECARB Demonstration Plant Goes Commercial

In 2003, when SSEB began its management of the Southeast Regional Carbon Sequestration Partnership, no one could have predicted that the partners not only would claim a successful demonstration of carbon capture, transport, and storage of CO<sub>2</sub>, but also a successful commercialization scale up of the technology. SECARB's 25 MWe demonstration at Alabama Power Company's Plant Barry in Bucks, Alabama, became a 240 MWe successful commercialization at NRG's Petra Nova – W.A. Parish Generating Station near Houston, Texas, with a celebration on April 13, 2017.

Today, Petra Nova is the world's largest post-combustion CO<sub>2</sub> capture facility attached to an existing coal-fired power plant. Using a proven carbon capture process developed jointly for the Plant Barry demonstration by Mitsubishi Heavy Industries and Kansai Electric Power Company, the technology employs a high-performance solvent for absorption and desorption of carbon dioxide that has the potential to enhance the long-term viability and sustainability of coal-fired power plants across the globe.

More than 90 percent of the captured CO<sub>2</sub> is sent by pipeline to Hilcorp Energy's West Ranch oil field 81 miles away to be used for enhanced oil recovery. Oil production is expected to increase from 300 barrels per day to over 15,000 barrels per day. The field is estimated to hold 60 million barrels of oil that can be recovered by using CO<sub>2</sub>.

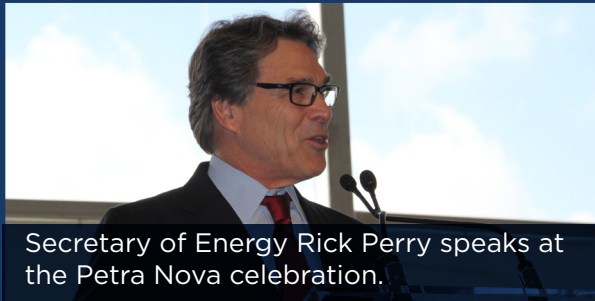


The Honorable Greg Abbott, Governor of Texas and SSEB member, speaks at the Petra Nova celebration on April 13, 2017.

Presenters at the April 13 ceremony included Mauricio Gutierrez, CEO of NRG Energy; Shunsaku Miyake, President and CEO of J.X. Nippon Oil and Gas Exploration; Texas Governor Greg Abbott; and U.S. Secretary of Energy Rick Perry. The Petra Nova project was selected by DOE to receive up to \$190 million under the Clean Coal Power Initiative, a public/private cost-shared collaboration.

Regarding SSEB's role in the project, NRG Vice President David Greeson responded that "we couldn't have done this without the SECARB demonstration that convinced our investors of the viability of the technology."





Secretary of Energy Rick Perry speaks at the Petra Nova celebration.



NRG Energy President and CEO Mauricio Gutierrez speaks at the celebration.



Gov. Abbott and Sec. Perry turn the valve to start the flow of CO<sub>2</sub> to Hilcorp's West Ranch Oilfield.



# Alabama's First Energy Day

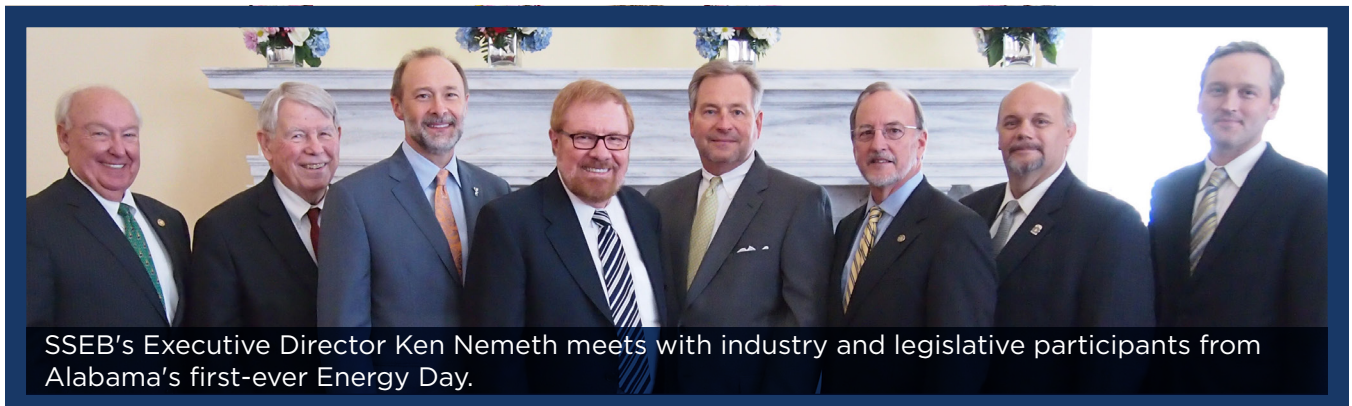
April 19, 2017

On April 19, 2017, the Southern States Energy Board joined the Energy Institute of Alabama to host the State's First Energy Day. Energy sector leaders and state policy-makers assembled for a wide-ranging discussion of the current and future state of the energy industry. The Board's Secretary and Executive Director, Ken Nemeth, moderated an expert panel discussion that covered a variety of topics ranging from expected federal regulation changes from the new Trump Administration to the importance of educating the work force to handle jobs in the changing energy industry. Panelists were Tennessee Valley Authority President and CEO Bill Johnson, State Geologist and Oil and Gas Supervisor of Alabama Nick Tew, PowerSouth President and CEO Gary Smith, Alabama Power Executive Vice President of External Affairs Zeke Smith, Coalbed Methane Association Executive Director Dennis Lathem, and ExxonMobil Mobile Bay Ops Manager Chris Golden.



Alabama Representative Randy Davis, Vice Chairman of the Southern States Energy Board, welcomed guests to the event, as did his colleagues Speaker of the House Mac McCutcheon, Senate President Pro Tempore Del Marsh, and Senate Majority Leader Greg Reed. Fellow members of the Alabama Legislature were present, as well as a contingent from the United Mine Workers of America.

The Energy Institute of Alabama is chaired by former Speaker of the House Seth Hammett, and the Institute's mission is to promote reliable, affordable and clean energy to help grow our economy, create high-paying jobs, and build public support for Alabama's energy industry. Learn more at [www.energyinstituteal.org](http://www.energyinstituteal.org).





# Annual Energy Briefing to Southern Legislators

July 29, 2017

State legislators face challenging and complex decisions that demand thoughtful and innovative policy-making when representing their constituents. The Southern States Energy Board's Annual Energy Briefing to Southern Legislators is a dynamic forum for addressing many issues related to energy and environmental legislation, federal and state policies, administrative and regulatory initiatives, and the implications for economic development. SSEB hosted the 2017 briefing in Biloxi, Mississippi, on July 29, 2017. The Honorable Terry Burton, Senate President Pro Tempore of Mississippi and SSEB Board Member, presided over the event.

Senator Terry Burton called the meeting to order and provided opening remarks, and Mississippi Speaker of the House Philip Gunn welcomed participants to the Magnolia State. Cooperative Federalism was a key theme during the meeting. SSEB's Secretary and Executive Director, Ken Nemeth, presented ways in which state authority can be expanded in cooperation with the federal government.

Alabama Representative Randy Davis, SSEB's Vice Chairman, presented members and participants with the Board's Preliminary 2017 Energy and Environment Legislative Digest, a compendium of energy and environmental legislation passed in member jurisdictions. He highlighted notable legislative trends in subjects impacting the Southeast in light of technology innovation, recent weather events, infrastructure upgrades, and tax credits for energy resource expansion. Rep. Davis also facilitated a panel discussion on 2017 legislative action in the states during which he summarized new laws passed by the Alabama Legislature during the



Rep. Rocky Miller, Rep. Tim Remole, and Sen. Ed Emery of Missouri participate in the roundtable discussion on legislation passed in SSEB member states.



regular session. Tennessee Representative John Ragan, SSEB Board Member, and Oklahoma Representative Weldon Watson, SSEB Treasurer, also shared with participants significant legislation passed in their respective states.

Patrick Sullivan, President of the Mississippi Energy Institute presented “U.S. Energy: The Great Bargain,” and Dr. Sumesh Arora, Director of Energy and

Natural Resources Division within the Mississippi Development Authority, presented “Spurring Innovation in Energy.” Dr. David Gattie, Associate Professor at the University of Georgia’s College of Engineering, and Laura Schepis, Executive Director of the Partnership for Affordable Clean Energy (PACE), presented jointly on net metering. During our event, PACE officially released its new document, co-authored by Dr. Gattie, entitled “Net

Metering: Costs, Customers and a Smarter Way Forward.”

To conclude the meeting, members participated in a legislative roundtable discussion, discussed the 2017 policy resolutions schedule and process, and received a preview of the SSEB’s 57th Annual Meeting by Hon. William E. “Bill” Sandifer, South Carolina House of Representatives and SSEB Executive Committee member.

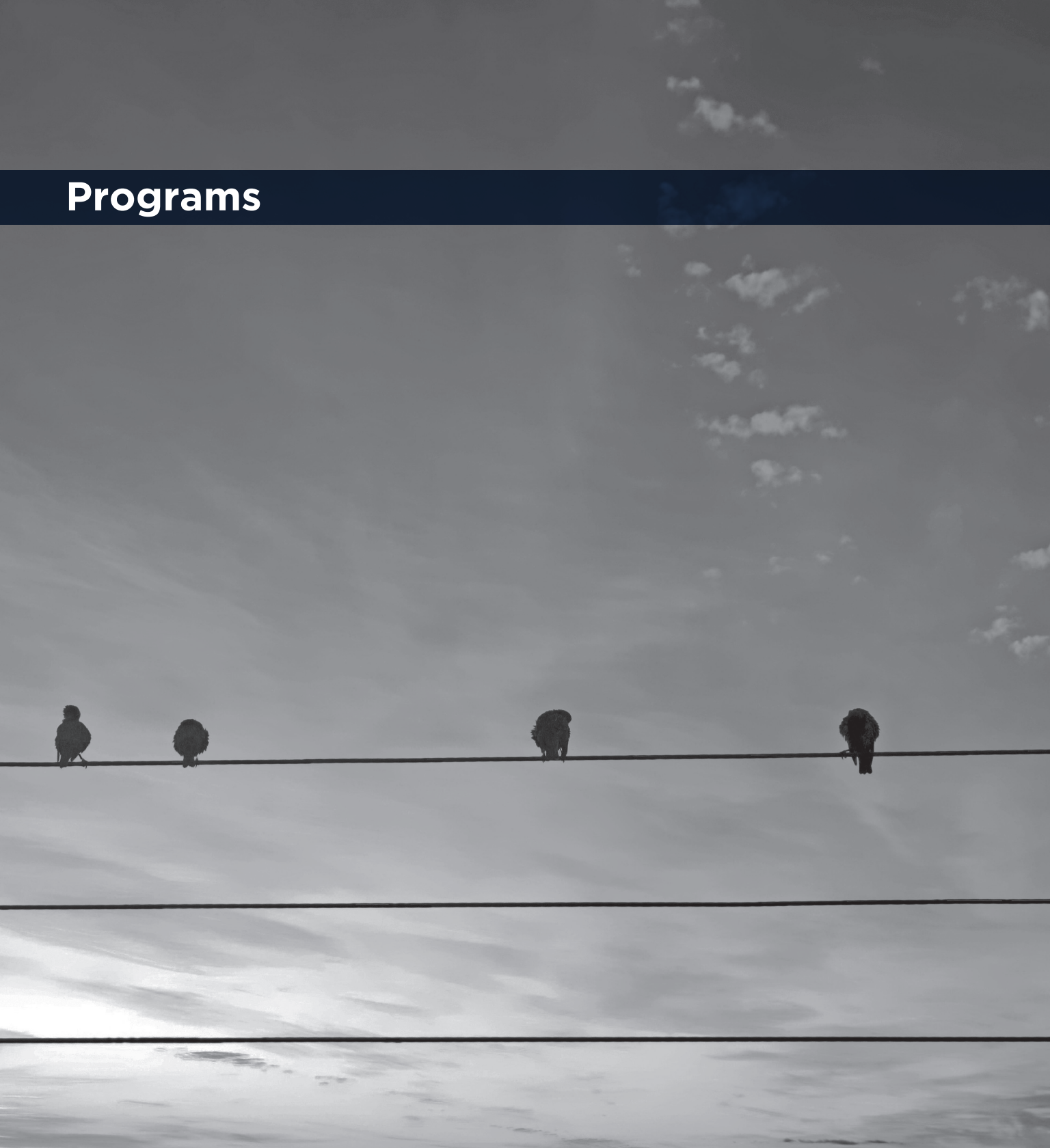


Southern States Energy Board Members participate in the Board's Annual Energy Briefing to State Legislators.



Sen. Eddie Joe Williams comments on legislation passed in Arkansas during the 2017 regular session.

# Programs



# Southeast Regional Carbon Sequestration Partnership



The Southeast Regional Carbon Sequestration Partnership is a program underway at the Southern States Energy Board to balance the environmental effects of fossil fuel-powered, electric-generating facilities. SECARB is one of seven Regional Carbon Sequestration Partnerships (RCSPs) nationwide funded by the U.S. Department of Energy's National Energy Technology Laboratory and cost-sharing partners. The primary goal of the SECARB Partnership is to promote development of a framework and infrastructure necessary for the validation and deployment of carbon dioxide capture and storage (CCS) technologies.

Key to the success of any CCS project is an operator's ability to predict and monitor the flow of CO<sub>2</sub> molecules injected into the subsurface and to communicate this information to stakeholders and regulators. The SECARB Early Test began in 2009 at Denbury Onshore, LLC's active CO<sub>2</sub>-enhanced oil recovery operation in the Cranfield oilfield near Natchez, Mississippi. The SECARB team successfully field-tested a variety of CO<sub>2</sub> monitoring, verification, and accounting (MVA) technologies to determine their commercial viability and robustness. The SECARB MVA program at Cranfield concluded in January 2015, and the cumulative total stored CO<sub>2</sub> mass monitored at Cranfield is 5,371,643 metric tons. The three research wells were safely plugged and abandoned in accordance with the Mississippi Oil and Gas Board rules in April 2015. Denbury's commercial operations continue.

This project was the first of the RCSPs to begin CO<sub>2</sub> injection and the first to achieve the goal of monitoring a one million metric ton injection. Data collected at Cranfield is utilized by the SECARB team and researchers worldwide to further refine reservoir models for similar geologic settings. In 2010, the international Carbon Sequestration Leadership Forum (CSLF) recognized the Early Test project at Cranfield for its outstanding accomplishments in advancing CCS MVA technologies.

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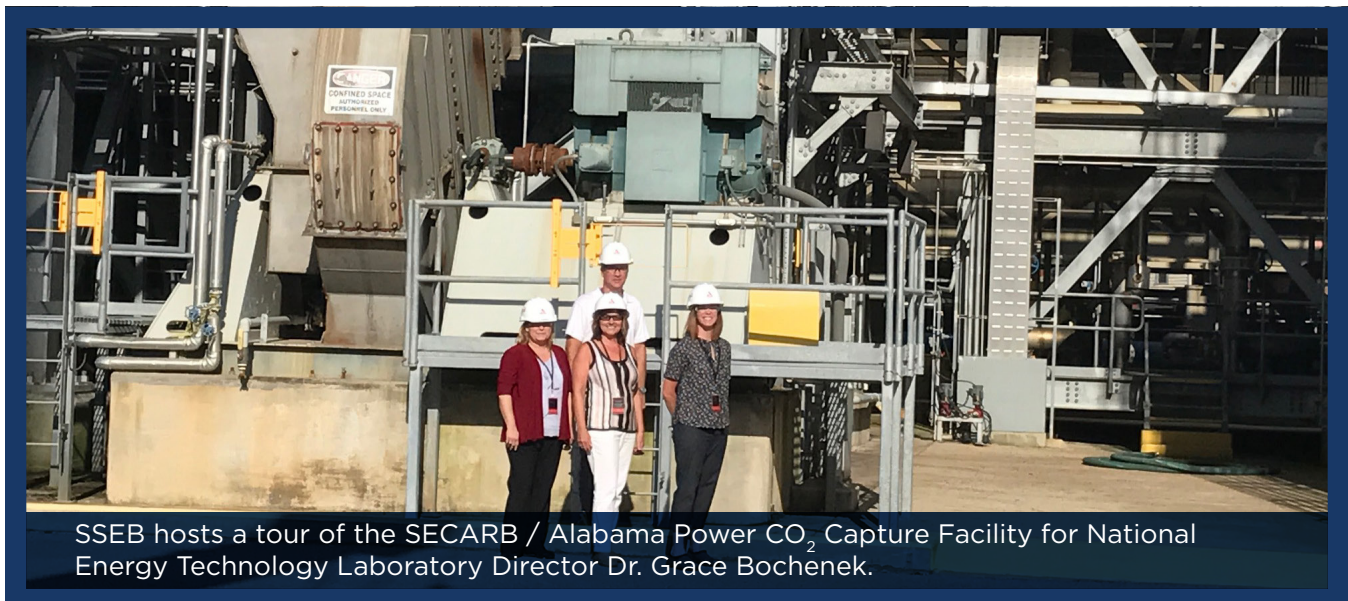
Knowledge gained from the Early Test is being applied at the Anthropogenic Test site in Alabama, where CO<sub>2</sub> injection began in August 2012. The project represents the largest U.S. demonstration project to date integrating CO<sub>2</sub> capture, transportation, and geologic storage utilizing anthropogenic (man-made) CO<sub>2</sub> from a coal-fired power plant. Under separate funding, the CO<sub>2</sub> is captured at Alabama Power Company's James M. Barry Electric Generating Plant located



in Bucks, Alabama. The CO<sub>2</sub> is transported 12 miles by pipeline and permanently stored within a deep saline formation at the Citronelle oilfield operated by Denbury. CO<sub>2</sub> injection ended in September 2014; more than 114,000 metric tons of CO<sub>2</sub> was injected and stored at the site. The SECARB partners are applying proven and experimental MVA technologies to monitor CO<sub>2</sub> movement in the subsurface during the current post-injection phase. In November 2013, the CSFL recognized the Anthropogenic Test project at Citronelle for its outstanding accomplishments in advancing CCS technologies.

Through a “Knowledge Sharing” activity established in 2011, the SECARB partners are facilitating interaction among scientists, researchers, and industry during which lessons learned from CCS projects around the globe are shared to further advance the technologies. Several SECARB partners and SSEB staff are serving as members of the U.S. Technical Advisory Group, approved by the American National Standards Institute, to mirror the International Organization for Standardization (ISO) Technical Committee 265 effort for the development of guidance and standards for carbon capture, transportation, and geological storage. Participation in this endeavor will ensure that the ISO process is both technically sound and the U.S. consensus position is represented.

SECARB continues to characterize the region’s onshore and offshore geologic storage options, monitor federal and state regulatory and legislative activities, and support education and outreach efforts related to the program. Please visit the SECARB website at [www.secarbon.org](http://www.secarbon.org) for the current status of all projects and related activities, upcoming meetings and workshops, social media subscriptions, and more.



SSEB hosts a tour of the SECARB / Alabama Power CO<sub>2</sub> Capture Facility for National Energy Technology Laboratory Director Dr. Grace Bochenek.

# Southeast Offshore Storage Resource Assessments

The Southern States Energy Board (SSEB) is leading a coalition of southern universities and technical experts to assess prospective geologic storage resources for carbon dioxide (CO<sub>2</sub>) in the State and Federal waters of three planning areas:

- The Mid-Atlantic;
- The South Atlantic; and
- The eastern Gulf of Mexico.

The goal of the Southeast Offshore Storage Resource Assessment (SOSRA) project is to develop a high-level approximation of the amount of CO<sub>2</sub> that might be stored utilizing key geologic and environmental factors that influence the storage potential.

The research includes significant advances in knowledge and technology that facilitate assessment and quantification of offshore CO<sub>2</sub> storage resources in the SOSRA region and provide a pathway toward commercialization.

The project is funded by the U.S. DOE NETL and SSEB serves as the overall lead for the project. To perform the work, SSEB has partnered with Virginia Polytechnic Institute and University's Virginia Center for Coal and Energy Research, the University of South Carolina, and Oklahoma State University for local management of the three planning areas. Virginia Department of Mines, Minerals, and Energy, South Carolina Geological Survey, Geological Survey of Alabama, Advanced Resources International, Inc., and Gerald R Hill, PHD, Inc. also provide technical expertise to the project.

During Phase I the team determined that the data quality and coverage within the study areas were adequate to facilitate a detailed assessment of offshore geology and quantification of CO<sub>2</sub> storage potential. Phase I of the project was completed in 2017 with a recommendation from the team to move into Phase II.



# Establishing an Early CO<sub>2</sub> Storage Complex in Kemper County, Mississippi: Project ECO<sub>2</sub>S

The Southern States Energy Board (SSEB) is a leading a coalition of universities and technical experts to establish a 438 million metric tons of capacity CO<sub>2</sub> Storage Complex adjacent to the Kemper County energy facility. Project ECO<sub>2</sub>S will pursue key advances in CO<sub>2</sub> storage knowledge and technology, including optimizing CO<sub>2</sub> storage efficiency, modeling the fate of injected CO<sub>2</sub>, and establishing residual CO<sub>2</sub> saturations. In addition, Project ECO<sub>2</sub>S will involve “real-life” experiences, issues, and challenges of scaling-up from its regional, pre-feasibility assessment of CO<sub>2</sub> storage to establishing a site-specific, CO<sub>2</sub> storage complex, including capturing the “lessons learned” in making this transition.

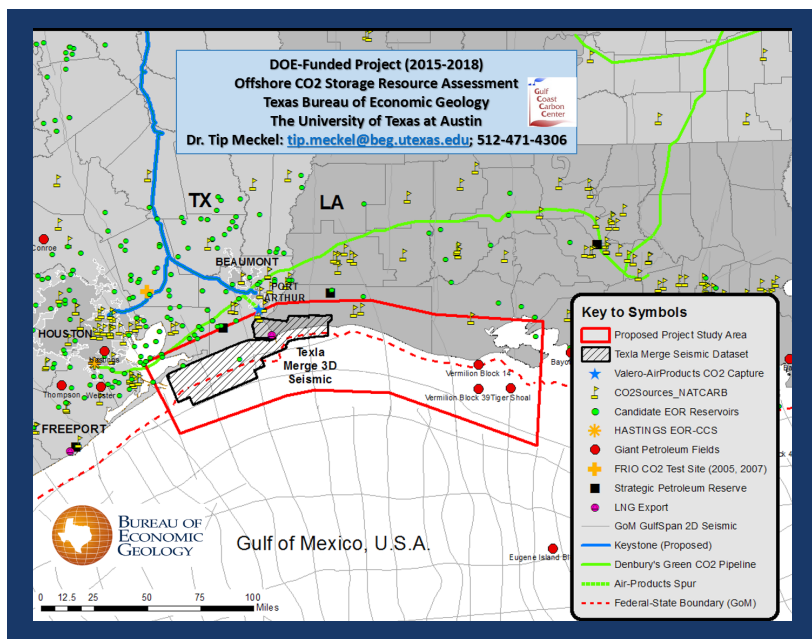
Project ECO<sub>2</sub>S is funded by the U.S. DOE NETL and headed by SSEB. Mississippi Power Company is serving as the site host as well as the primary cost share partner. The project includes technical and field implementation support from Advanced Resources International and will obtain analytical support from two national laboratories (Los Alamos and Lawrence Berkeley), a host of universities (Auburn University, Mississippi State University, Oklahoma State University, Virginia Polytechnic Institute and State University, University of Alabama at Birmingham, and University of Wyoming) and other key participants, including Battelle Memorial Institute and the Geological Survey of Alabama.

Three regionally extensive porous and permeable saline formations with thick confining systems have been identified at the Storage Complex that provide attractive settings for injection and storage of CO<sub>2</sub>. The Complex will have the capacity to receive 3 million metric tons per year of CO<sub>2</sub>, and potentially three times as much as determined by pre-feasibility models for a period of at least 30 years.





# Offshore CO<sub>2</sub> Storage Resource Assessment of the Northern Gulf of Mexico (Texas–Louisiana)



The University of Texas at Austin is leading a complementary project funded under the same DOE program entitled the Offshore CO<sub>2</sub> Storage Resource Assessment of the Northern Gulf of Mexico (Texas–Louisiana). The University of Texas at Austin, in partnership with Southern States Energy Board, will study the inner continental shelf portions of the Texas and Louisiana Gulf of Mexico coastal areas in order to assess the CO<sub>2</sub> storage capacity of depleted oil and natural gas reservoirs. This work also will assess the ability of regional saline geological formations to safely and permanently store nationally significant amounts of CO<sub>2</sub>.

The objective of this study is to conduct an offshore carbon storage resource assessment of the study area. This will be completed by 1) assessing the CO<sub>2</sub> storage capacity of depleted oil and natural gas reservoirs utilizing existing data (well logs, records and sample descriptions from existing or plugged/abandoned wells, available seismic surveys, existing core samples, and other available geologic and laboratory data) from historical hydrocarbon industry activities in the heavily explored portions of the inner continental shelf of the Texas and Louisiana Gulf of Mexico coastal areas; and 2) assessing the ability and capacity of saline formations in the region to safely and permanently store nationally-significant amounts of anthropogenic CO<sub>2</sub> using existing data. Additionally, the study will identify at least one specific site with the potential to store 30 million tons of CO<sub>2</sub> or more, which could be considered further for a commercial or integrated demonstration project in the future. The project also will engage the public and other stakeholders in the region through outreach activities to inform them of the study's objectives and results.

# Industrial Carbon Capture, Utilization, and Storage

In May 2016, the Southern States Energy Board added a new project to its carbon management portfolio. While much of the Board's carbon dioxide capture, utilization and storage (CCUS) research, development, and demonstration to date has been focused on the power sector, our staff currently is identifying opportunities for CCUS technology deployment at large, industrial sources of CO<sub>2</sub>. Industrial CCUS (ICCUS) holds great promise for reducing CO<sub>2</sub> emissions in our region, particularly in areas where petrochemical facilities and refineries are located in clusters. CO<sub>2</sub> at many industrial sources can readily be captured, treated and utilized, thereby opening up economic opportunities while reducing atmospheric CO<sub>2</sub> levels.

In cooperation with the U.S. Department of Energy's Office of Fossil Energy, SSEB has assembled a working group of state and industry CCUS experts representing Louisiana, Mississippi, and Texas. The working group provides guidance and assistance to DOE and SSEB in developing an ICCUS roadmap for the purpose of rapidly implementing industrial CCUS applications that value CO<sub>2</sub> as a commodity.

The working group first convened in New Orleans, Louisiana, on June 14-15, 2016. During the kickoff meeting, the working group members shared their CCUS project experiences and then began examining policy and financial obstacles to the deployment of ICCUS technologies. Following the meeting, SSEB documented lessons learned and started building a "toolbox" for industry on implementing CCUS technologies.

A public workshop was held in November 2016 aimed at reaching interested parties. SSEB and its team members are following up on the workshop by helping to foster business and local/state government relationships necessary to facilitate commercialization of industrial CCUS in the region.



Participants in the November 2016 ICCUS Workshop.

# Southeast Regional Carbon Sequestration Technology Training Program



Carbon capture, utilization, and storage (CCUS) technologies have tremendous potential for reducing carbon dioxide emissions and mitigating global climate change. These technologies encourage economic growth and have manageable influence on energy use. Deploying these technologies on a commercial scale will require expanding the workforce, including geologists, engineers, scientists, and technicians, trained in CCUS specialties.

In 2009, the U.S. Department of Energy's National Energy Technology Laboratory selected seven projects to help develop regional sequestration technology training centers in the United States. The Southeast Regional CO<sub>2</sub> Sequestration Technology Training Program (SECARB-Ed) was managed and administered by the Southern States Energy Board from November 16, 2009, to November 15, 2012. During this performance period, the efforts of SECARB-Ed and partners resulted in a total of 1,951 professional development hours awarded to 1,131 participants.

In a second initiative, SSEB proposed continuing its in-house elements of the SECARB-Ed program under a grant from the DOE's Office of Fossil Energy and the Office of Clean Coal & Carbon Management. This year's highlights include collaboration between EnTech Strategies, SECARB-Ed, and Southern Company, to support the Research Experience in Carbon Sequestration (RECS) 2017 in Birmingham, Alabama, on July 22-29. RECS is the premier CCUS education and training experience in the United States. The intensive 7-day program combines classroom instruction with group exercises, site visits, and field activities and covers the science, technology, policy, and business topics associated with CCUS deployment.





# Committee On Clean Coal Energy Policies And Technologies

Composed of governor's representatives, state legislators, state regulators, industries, academia, and business executives, the Southern States Energy Board's Committee on Clean Coal Energy Policies and Technologies advances opportunities for applied research and development, investment, international cooperation, and technology design for coal in the southern region. During its tenure, the committee has been responsible for coupling the development of clean coal technologies with potential domestic and international economic development opportunities. The program also affords partners the opportunity to leverage U.S. resources to influence international occasions for the deployment of those coal-based technologies that mitigate greenhouse gases and provide carbon storage solutions to reduce the effects of carbon dioxide emissions worldwide.

SSEB maintains a productive partnership for examining issues related to coal and carbon management with the U.S. Department of Energy's Office of Fossil Energy and the Office of Clean Coal & Carbon Management. International efforts, such as participation in the 23 nation Carbon Sequestration Leadership Forum, are coordinated with the Cleaner Fossil Fuel Systems Committee of the World Energy Council and the United States Energy Association.

Recently, the committee has been focusing on those issues related to carbon management and coal use in the South, especially legislation currently being considered at federal and state levels. The committee met on May 22-23, 2017, in Kingsport, Tennessee. On May 22 the committee held a roundtable discussion.

Outcomes of the roundtable discussion included stated intentions by several SSEB legislative members to bring resolutions before the board at its Annual Meeting in late September 2017. Additionally, committee members provided assurances that the key issues and priorities highlighted during the discussion would be brought forth during meetings with governors' offices, legislative leadership, state regulators, and other related national and regional organizations.



Rep. Rocky Adkins, House Minority Leader of Kentucky, presides during the SSEB Committee on Clean Coal Energy Policies and Technologies meeting in May 2017.

Key issues under consideration and discussion during this year include:

- The critical loss of coal capacity due to retirement in terms of planning and operating a reliable electric system
- Factors that are impacting jobs in the coal industry; and about regional differences in those jobs
- The role of utilities and industry groups (EEI, EPRI, other) in R&D for clean coal
- The importance of regulation in the decline of coal use in this country
- The outlook for tax incentives and what role should they play in reviving the coal industry. Other tools available that should be considered.
- Programs needed to improve employment opportunities in the coal field
- Critical needs for infrastructure in the next 10 years
- State-level legislative barriers to infrastructure development



Gov. Asa Hutchinson, Arkansas, visits the U.S. Department of Energy's Fossil Energy Exhibit at SSEB's 56th Annual Meeting in September 2016.

# Central Appalachian Basin Unconventional (Coal/Organic Shale) Reservoir

## Small-Scale CO<sub>2</sub> Injection Test

In recent years a major focus of the Southern States Energy Board and the Virginia Center for Coal and Energy Research (VCCER) at Virginia Tech has been carbon management. Currently, with the support of SSEB, the VCCER is in phase 3 of the project, Central Appalachian Basin Unconventional (Coal/Organic Shale) Reservoir Small-Scale CO<sub>2</sub> Injection Test, an almost \$15 million partnership with the National Energy Technology Laboratory of the U.S. Department of Energy to perform a test, injecting 14,500 tons of CO<sub>2</sub> in unconventional geologic reservoirs at two field sites. A 510-ton injection has been successfully completed in a horizontal organic shale well in Morgan County, Tennessee. 14,500 tons of CO<sub>2</sub> have been injected into three vertical coalbed methane wells in Buchanan County, Virginia.

This project will reduce uncertainties associated with long-term CO<sub>2</sub> storage options in unconventional reservoirs. To accomplish this goal, the project team is designing and implementing geologic characterization studies and CO<sub>2</sub> injection and monitoring activities to test unconventional storage formations in central Appalachia. The project team is tracking the migration of CO<sub>2</sub> throughout the injection and post-injection phases. One aspect of this project is enhanced gas recovery, potentially resulting in significantly increased revenue and value of reserves to offset the additional costs of carbon storage, which will be advantageous to the energy consumer as well as the energy industry. It is anticipated that this project will conclude with monitoring and analysis during the current phase 3 and end in December 2017 with the wells returned to production wells.



SSEB supports the field demonstration by providing project management and outreach and education expertise. SSEB ensures that the results and data gathered as part of this research effort and pilot study are disseminated in a timely fashion. The information is distributed through the Southeast Regional Carbon Sequestration Partnership and the other Regional Carbon Sequestration Partnerships. Then, the data is integrated into the National Carbon Sequestration Database and Geographic Information System (NATCARB) and the Fifth Edition of the DOE Carbon Sequestration Atlas of the United States and Canada.



# Transuranic Waste Transportation

The SSEB region is home to two of the Department of Energy's national laboratories with large reserves of Cold War era contaminants identified for disposal as a part of the agencies environmental management mandate. The geographical proximity of the Oak Ridge National Laboratory and the Savannah River Site and the impending shipments of waste materials from them destined for the Waste Isolation Pilot Plant (WIPP) was the impetus for the creation of the Transuranic Waste Transportation (TRU) Working Group. This group of radiological health professionals and emergency response personnel receive funding from the Board, in excess of \$1 million dollars, to establish programs within their states to support the national campaign and respond to any potential incident involving a shipment. After the accident and subsequent three year closure (February 2014 - April 2017) of the WIPP site in Carlsbad, New Mexico, the TRU Working was integral in maintaining their level of preparedness for the reopening of the facility. Therefore, prior to the resumption of the WIPP campaign, SSEB was enlisted by DOE's Carlsbad Field Office to plan a roadshow. The roadshow involved SSEB staff, DOE management, Commercial Vehicle Safety Alliance officials and SSEB WIPP program managers visiting each southern corridor state to educate and inform first responders, community leaders and the general public of the various elements of the shipping program. This outreach effort helped to reinstitute institutional protocols which were standard practice before the site's closure.



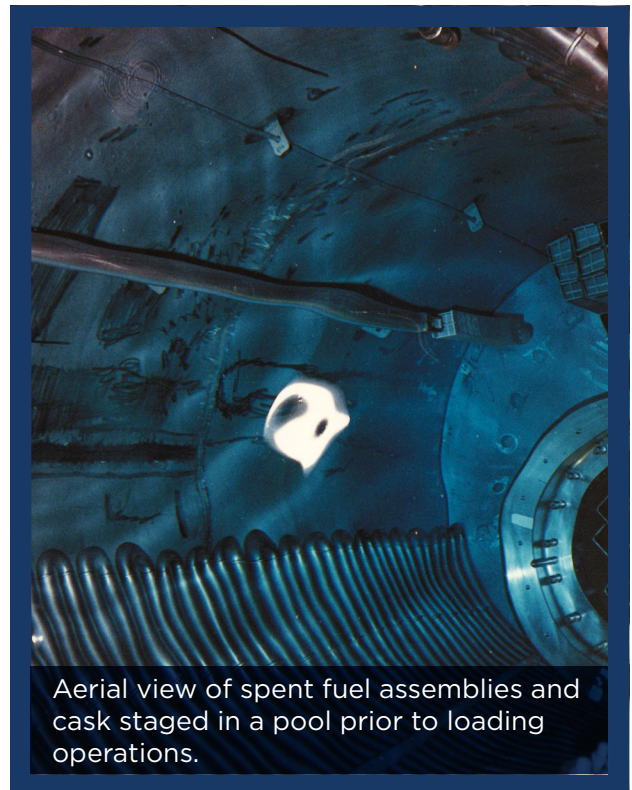
Since WIPP reopened, several TRU Waste shipments have departed from the south without occurrence. Projected TRU Waste shipments for the region in the upcoming year (August 2017 - July 2018) include 40 from the Oak Ridge National Laboratory and 10 from the Savannah River Site. As a result of the renewed shipping schedule, SSEB TRU Waste corridor states continue their training regimen to respond effectively to any potential transportation accident scenario. In this regard, the state of Mississippi has begun planning efforts for a Waste Isolation Pilot Plant Exercise or WIPPTREX to be held next year in Pearl,

Mississippi, on March 22-24. The WIPPTREX will allow first responders in the state along the I-20 corridor to validate their knowledge and skills for remediating an accident involving a TRU Waste shipment.

# Foreign Research Reactor Spent Nuclear Fuel Shipments

The Southern States Energy Board is steadily approaching nearly a quarter of a century partnership with the National Nuclear Security Administration's Office of Material Management and Minimization (M3) to remove or dispose of U.S. origin highly-enriched uranium (HEU) and low-enriched uranium from foreign countries. In the early 1990s the Department of Energy (DOE) enlisted the efforts of the Board when it was determined an urgent relief shipment of these materials would be entering the U.S. via the Military Ocean Terminal Sunny Point in North Carolina en route to the Savannah River Site (SRS). SSEB responded by creating an adhoc committee composed of professionals representing various disciplines to oversee the coordination, transportation, and emergency response planning efforts associated with the return of these materials. Eventually, DOE would conduct an extensive environmental impact statement which recommended the Naval Support Activity Charleston as the east coast port of entry for the remainder of these shipments. Thus began the formalization of SSEB's Foreign Research Reactor Spent Nuclear Fuel Transportation Working Group, which to this present date assists DOE with the mission of reducing and protecting vulnerable nuclear and radiological material located at civilian sites worldwide.

Most recently, the Working Group participated on a conference call in May 2017 for the planning of a summer shipment destined for SRS. To date 67 shipments, the majority (55) of which have entered the U.S. via the southern region (Naval Support Activity Charleston), have been completed from 33 countries. Meanwhile, the Canadian Campaign which initiated in the summer of 2015 involving the return of HEU from the Chalk River facility in Ontario continues to progress without incident. The majority of M3's domestic movements traverse many southern corridor states en route to their eventual disposition at SRS. Therefore, SSEB will continue working with the Department and its member states along the shipping routes to acquire and maintain high competencies of training and preparedness for this vitally important nonproliferation effort.



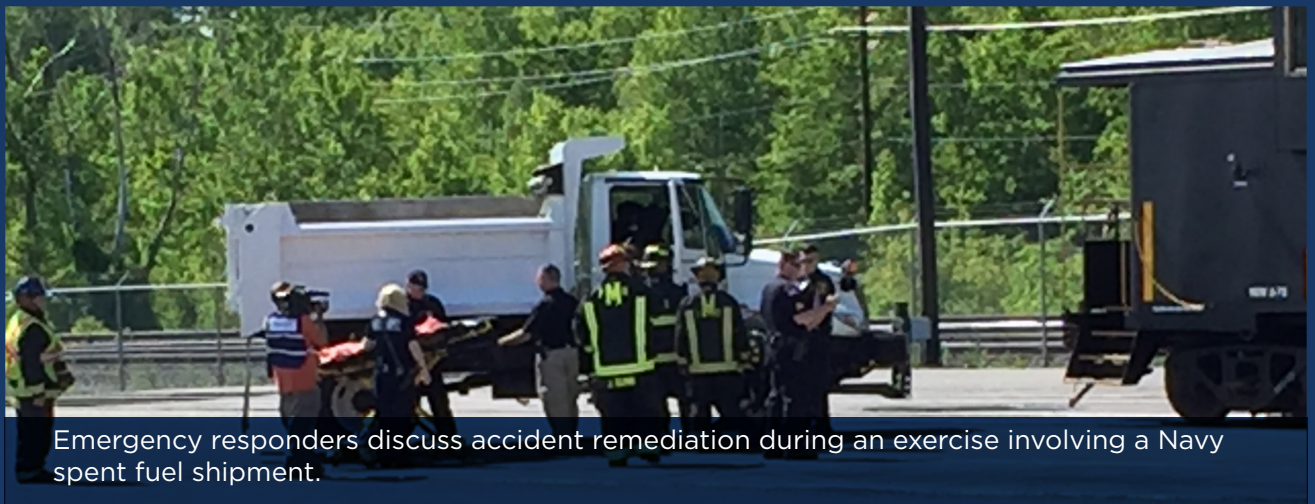
Aerial view of spent fuel assemblies and cask staged in a pool prior to loading operations.

# Southern Emergency Response Council

In 1972, a majority of the Board's governors formed the Southern Emergency Response Council (SERC) as a committee responsible for the administration of a mutual aid agreement offering state-to-state assistance in the case of a radiological incident involving a nuclear power plant. The SERC signatory states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

The Southern Mutual Radiation Assistance Plan or SMRAP is the documentation which identifies how the procedures would be conducted in the event of such an emergency. Created as a blueprint for coordinating radiological emergency assistance capabilities among participating states in the southern region, SERC representatives review, revise, and administer SMRAP on an annual basis to reflect changes in state emergency response capabilities and equipment. This document outlines the mutual aid agreement, the implementation process, emergency response contacts, and available state resources. As a part of the scope of this endeavor, the Southern States Energy Board acts as regional coordinator to simulate the activation of the SMRAP during state nuclear power plant exercises. Since the beginning of the year, several states have incorporated SSEB into their evaluated drills and have made contact to request personnel, equipment, vehicles, and subject matter expertise from their border states.

A SERC meeting is held once per year in conjunction with the Organization of Agreement States meeting. This gathering allows members the opportunity to discuss matters related to SMRAP. The group met recently on August 21, 2017, in Memphis, Tennessee, to ratify the current edition of SMRAP.



Emergency responders discuss accident remediation during an exercise involving a Navy spent fuel shipment.



# Radioactive Materials Transportation

The Radioactive Materials Transportation Committee is the mechanism through which the Board collaborates with the Department of Energy to developing a strategy to safely transport and dispose of the country's inventory of used nuclear fuel and high-level radioactive waste. The mission of managing the commercial nuclear fuel program is under the direction of DOE's Office of Integrated Waste Management (IWM) within the Office of Nuclear Energy. SSEB entered into five year cooperative agreement with IWM to address policy issues, shipment planning and preparedness, communications and to hold biannual meetings of its Committee composed of gubernatorially-appointed professionals (e.g. radiological health officials, field specialists, state emergency response planners, and law enforcement).

In March of 2017, SSEB staff and Radioactive Materials Transportation Committee representatives from Maryland and Texas attended the IWM Core Group Meeting in Washington, D.C. During this meeting, they received briefings pertaining to the status of several ongoing activities of the IWM. In addition, a segment of the meeting was dedicated to a Execution Strategy Analysis Workshop during which DOE contractors debuted some of their models covering the following topics: Transportation; Consent Based Siting; National Environmental Policy Act Process; Storage/Licensing; and Integration of Prospective Sites. In August of 2017, the IWM Core Group journeyed to Colorado Springs, Colorado, to meet again with a focus on rail transportation and routing. As a part of this gathering SSEB staff and committee members toured the Transportation Technology Center which employs 48 miles of railroad track available for testing locomotives, vehicles, track components, and signaling devices. The DOE's Rail/Routing Ad Hoc Working Group also convened during this meeting and held a mini workshop during which state volunteers used software to generate potential rail transport routes and evaluate the impacts on their jurisdictions. SSEB Committee members from Arkansas and Tennessee participated in this exercise and DOE invited representatives from the major railroad companies to attend and answer questions regarding their industry transportation practices.



National Transportation Stakeholders Forum attendees tour the Holtec Manufacturing Division and witness a partially constructed dry storage unit destined for Plant Alvin W. Vogtle Nuclear Plant in Georgia.

# Energy and Environment Legislative Priorities and Analyses

The Southern States Energy Board's Legislative Digest serves as a compendium of energy and environmental legislation passed by the Board's 18 member states and territories. For more than four decades, SSEB has published the annual digest as a reference tool and guide for state legislators and their personnel. The digest examines and tracks legislative trends by state.

During the 2017 legislative sessions, the southern states passed more than 300 energy and environmental bills. As technology advances, SSEB member states continue to address issues surrounding energy development and distribution. Within the digest, there are many bills relating to pipelines, generation, infrastructure development, transmission, and siting concerns as well as the evolving markets pursuant to alternative energy development. Our member states continue leading the way to American energy independence with their abundant, diverse resources coupled with legislative and regulatory actions that foster economic growth.

When examining legislation passed state-by-state, it is not unusual to observe certain trends or themes. Several states passed legislation pertaining to the construction and regulation of oil and gas pipelines. Arkansas established provisions for rate adjustments to promote the expansion of natural gas infrastructure. Three states, Alabama, Kentucky, and Texas, all approved resolutions urging the Congress of the United States to enact legislation to expand and extend the current federal tax credit for carbon capture, utilization, and storage under Section 45Q of the Internal Revenue Code.



Many states addressed tax credits for both renewables and natural gas expansion. Tennessee and North Carolina imposed certain temporary moratoriums on new construction of wind energy facilities, while Maryland established a permanent prohibition of hydraulic fracturing of a well for the exploration of oil or natural gas. Alabama, Arkansas, and Georgia passed measures establishing procedures relating to the emergent technology of autonomous vehicles.

Regarding environmental trends, six states (Louisiana, North Carolina, South Carolina, Texas, Virginia, and West Virginia) passed a bevy of legislation meant to address the chronic problem of flooding and stormwater management that has plagued the Southeast in recent years.

# Partnerships





# Our Partners

The Southern States Energy Board has many collaborative efforts underway and through these robust partnerships with government, business, industry, and academia, SSEB states and territories benefit from the expertise of energy and environmental leaders in the country.

The core of this strategy pivots on the Board's Associate Members who represent the region's and Nation's energy providers, resource companies, educational institutions, and technology developers. The SSEB Associate Members program was founded in 1981 by Kentucky Governor John Y. Brown during his chairmanship.

The Associate Members act in an advisory capacity to the Board. With increasing interest from the region's prominent energy industries and organizations, SSEB gains a broad depth of knowledge and diverse perspectives on the impact of energy and environmental policies and regulations on the region's economy.

SSEB participates on the U.S. Technical Advisory Group of the International Organization for Standardization (ISO) Technical Committee 265 for the development of guidance and standards for carbon capture, transportation, and geological storage. Knowledge gained from SSEB's carbon management programs is being transferred through the ISO process to ensure that standards are both technically sound and that the South's position is represented. SSEB also is a founding member of the Global CCS Institute, an international organization focused on accelerating the deployment of CCS as an imperative technology.

Through a collaborative effort with the U.S. Department of Energy's Office of Fossil Energy and the U.S. Energy Association, the Board became a founding stakeholder in the Carbon Sequestration Leadership Forum in 2003. The policy and technical forums of CSLF further international cooperation and understanding of carbon dioxide capture, utilization, and storage; legal and regulatory issues; intellectual property; and many related matters. The CSLF has recognized SSEB's two SECARB Partnership projects as international programs of excellence.

SSEB also works closely with the Government of Canada. This consular presence promotes business development, investment, tourism, culture, and information exchange between Canada and SSEB states and territories. The Board's partnership with Consuls General offices throughout the South has resulted in economic, educational, and scientific opportunities for our member states.

On January 6, Scott Moe, Saskatchewan's former Minister of Environment, met with Louisiana Department of Natural Resources' Secretary Tom Harris and Assistant Secretary for Mineral Resources David Boulet to discuss the role of provincial and state governments in carbon capture, utilization, and storage commercialization.

The minister and secretaries were joined by representatives of SSEB and the Louisiana State University (LSU) Center for Energy Studies. The Louisiana Department of Natural Resources is working with SSEB, LSU, and the U.S. Department of Energy's Office of Fossil Energy on the Central Gulf Coast Initiative for CO<sub>2</sub> Utilization and Storage Acceleration (CO<sub>2</sub> USA).

On a national level, SSEB is an affiliate member of the National Association of State Energy Officials. In this relationship, SSEB works closely with state energy office directors in the southern region on a wide array of programs, ranging from energy efficiency, weatherization, and energy security and infrastructure.

To foster regional cooperation and collaboration, the Board continues a strong working relationship with other regional organizations such as the Eastern Interconnection States Planning Council, the Southern Legislative Conference of the Council of State Governments, the Southeastern Association of Regulatory Utility Commissioners, the Virginia Coal and Energy Alliance, the Carbon Utilization Research Council, and the Southeast Energy Efficiency Alliance. SSEB strives to foster ongoing relationships with other regional and state organizations with similar goals.

SSEB's Radioactive Materials Transportation Committees have worked in conjunction with their counterpart committees of the other "state and tribal regional groups" including the Council of State Governments (Northeastern and Midwestern Offices), Western Interstate Energy Board, National Conference of State Legislatures, and Western Governors' Association. This collaboration has resulted in the development of national policy and initiatives between the states, tribes, and Department of Energy for consultation and cooperation regarding issues associated with the safe transport of radioactive materials.

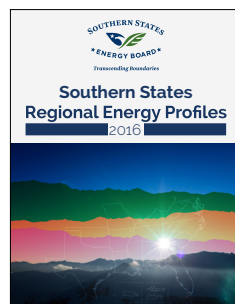
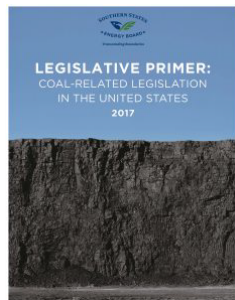
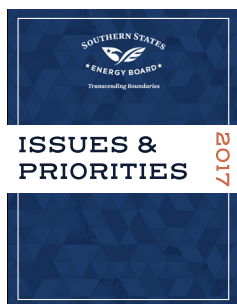
These are only a few examples of the collaborative relationships SSEB experiences through its diverse partnerships. Building partnerships is an essential goal of the Board in order to leverage opportunities and expand its expertise to assist its member states. These collaborations allow SSEB to focus its program and financial commitments to the benefit of the entire southern region.



# Educating Stakeholders

Southern States Energy Board prioritizes outreach and education through a variety of venues including keynote presentations, panel discussions, conferences and workshops, exhibits, and myriad activities meant to engage public officials and other stakeholders. SSEB strives to enhance and improve understanding and awareness of domestic energy development, energy and environmental policies, and clean energy technologies and their importance in the region. Examples of significant engagements from the past year include:

- Industry Leaders at Wye River Workshop – State Government Perspectives on Invigorating the U.S. Clean Coal Industry | Presentation
- Virginia Coal and Energy Alliance meeting “SSEB Coal: Launching a New Era” | Opening Presentation and Panel Discussions
- Green Guy Radio – Southern States Energy Board Energy Issues in the South | Radio Interview
- Carbon Sequestration Leadership Forum – Best Practices for Public Outreach and Education in dealing with CCS Projects | Presentation
- Energy Institute of Alabama Energy Day – Future of Energy Industry in the South | Panel Moderator
- CO<sub>2</sub> Carbon Management Workshop – Carbon Management Update from the Southern States Energy Board and SECARB | Presentation
- Power Experts Conference – Energy Issues in the Southern States Energy Board Region | Presentation
- Southeast Environmental Conference – Fresh Look at the Utility of Tomorrow | Presentation
- Arkansas Joint Energy Committee – SSEB Briefing to the Legislators | Presentation
- SSEB Associate Member Meetings – Host
- SSEB Annual Energy Briefing to Southern Legislators | Presentation
- State Energy Offices – Briefing on SSEB Programs and Activities | Presentation
- SECARB 12th Annual Stakeholder Briefing and Partners Meetings for the Southeast Offshore Storage Resource Assessment and Project ECO<sub>2</sub>S Programs | Host and Facilitator





- National Nuclear Materials Transportation Stakeholder Forum and Radioactive Materials Transportation Committee Meetings | Session Organizer and Moderator
- Committee on Clean Coal Energy Policies and Technologies Meeting | Host
- Research Experience in Carbon Sequestration (RECS) Program | Co-sponsor and CCS Field Site Host
- Government Consulate (Canada) | Participant
- NARUC, Southface, NASEO, Clean Energy Vehicles | Participant
- Southwest Virginia Coalfields Legislative Reception | Participant
- Governor's Summit on Energy Security and Infrastructure | Host and Facilitator
- Petra Nova Celebration | Participant
- Global CCS Institute's Annual DC Forum | Presentation
- International Energy Agency's Greenhouse Gas R&D Programme Peer Review of SECARB Program | Presentations
- Industrial CCUS Forum | Host and Presentations
- North American Energy Ministers Trilateral Meeting – 3rd and 4th CCUS Workshops with Briefings on SECARB Activities | Presentations
- Midwest Geological Sequestration Consortium – SECARB and Project ECO<sub>2</sub>S | Presentation
- U.S.-Norway Collaboration on CCS/CCUS – Regional Commercialization of Industrial CCUS | Presentation
- National Energy Technology Laboratory Director's Tour of SSEB's CCS/CCUS Project Sites | Host
- 13th International Conference on Greenhouse Gas Control Technologies – Demonstration of CO<sub>2</sub> Containment and Non-Endangerment at the SECARB “Anthropogenic Test” Site near Citronelle, Alabama | Presentation
- American Institute of Chemical Engineers – Adapting Power Generation Lessons Learned to Industrial CO<sub>2</sub> Capture | Presentation
- Southeastern Energy Society | Presentation
- Texas WIPPTREX 2016 | Exercise Evaluator
- Radioactive Materials Transportation Committee Meetings | Host
- Mississippi WIPP Program Update / Planning Meeting | Speaker
- Waste Isolation Pilot Plant – Savannah River Site Corridor Roadshow | Speaker
- Spring 2017 Radiological Working Group Meeting | Speaker
- Mississippi WIPPTREX 2018 Planning Meeting | Participant in Planning Session
- Spent Nuclear Fuel Rail/Routing Ad Hoc Working Group Workshop | Presenter

# Sources of Support

The Southern States Energy Board’s primary source of funding is its annual appropriations from the 18 member states and territories. Each member’s share is computed by a formula written into the original compact. This formula is composed of an equal share, per capita income, and population. The Board has not requested an increase in annual appropriations since 1987. The compact authorizes the Board to accept funds from any state, federal agency, interstate agency, institution, person, firm, or corporation provided those funds are used for the Board’s purposes and functions.

SSEB continues to lead an Associate Members program composed of industry partners who provide an annual contribution to the Board. Membership includes organizations from the nongovernmental sector, corporations, trade associations, and public advocacy groups. The Associate Members program provides an opportunity for public officials and industry representatives to exchange ideas, define objectives, and advance energy and environmental planning to improve and enhance the South’s economic and environmental well-being.

SSEB also receives corporate sponsorships, registration fees, and in-kind contributions to support the expenses associated with the SSEB annual meeting, research projects, and events.

## State Appropriations

<b>Alabama</b> \$32,572	<b>Maryland</b> \$37,192	<b>South Carolina</b> \$31,372
<b>Arkansas</b> \$31,027	<b>Mississippi</b> \$29,077	<b>Tennessee</b> \$34,267
<b>Florida</b> \$47,212	<b>Missouri</b> \$36,247	<b>Texas</b> \$55,402
<b>Georgia</b> \$35,782	<b>North Carolina</b> \$37,042	<b>U.S. Virgin Islands</b> \$25,297
<b>Kentucky</b> \$32,197	<b>Oklahoma</b> \$32,512	<b>Virginia</b> \$38,362
<b>Louisiana</b> \$33,817	<b>Puerto Rico</b> \$25,597	<b>West Virginia</b> \$28,732

# Year in Pictures



Scan this QR code to view more photographs from past events.



Joe Giove discusses DOE coal-related projects with members of the SSEB Committee on Clean Coal Energy Policies and Technologies, May 2017.



SSEB and members of the Carbon Utilization Research Council meet with Kentucky Congressman Hal Rogers on June 28, 2017.



The crowd listens as Sarah Wilshaw, Consul General of Canada in Dallas, Texas, speaks at the 56th Annual Meeting.



Ken Nemeth, Jim Powell, and Rafael Llompart representing SSEB meet with Puerto Rico's Governor Ricardo Rosselló.

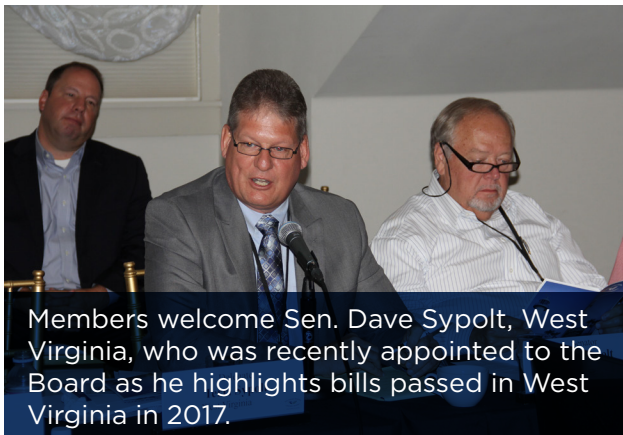


Board Members participate in the 56th Annual Meeting in Rogers, Arkansas.

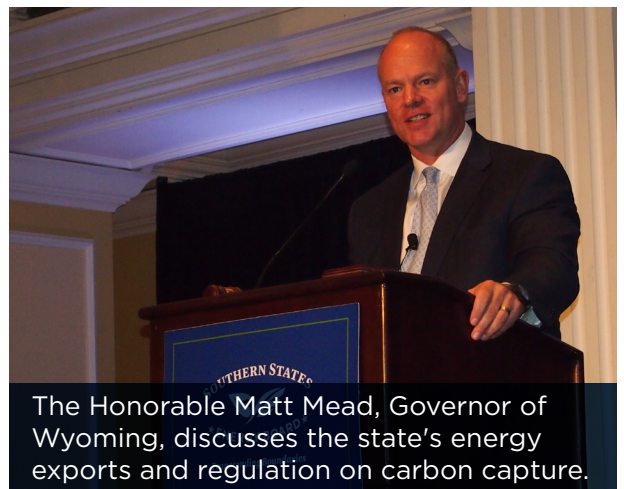


Rep. Randy Davis of Alabama engaging with presenters during the Board's Annual Meeting.









# Board Members

## 2016-2017 Executive Committee

The list of members below reflects officials who serve the Board as of September 1, 2017. For a current roster, please contact the SSEB staff or visit our website at [www.sseb.org](http://www.sseb.org).



**Chairman**  
The Honorable Asa  
Hutchinson, *Governor of  
Arkansas*



**Vice-Chairman**  
Representative Randy  
Davis, *Alabama*



**Chairman-Elect**  
The Honorable Phil  
Bryant, *Governor of  
Mississippi*



**Treasurer**  
Representative Weldon  
Watson, *Oklahoma*



**Member, Executive  
Committee**  
The Honorable Kenneth  
Mapp, *Governor of U.S.  
Virgin Islands*



**Member, Executive  
Committee**  
Senator Eddie Joe  
Williams, *Arkansas*



**Member, Executive  
Committee**  
Senator Mark Norris,  
*Tennessee*



**Member, Executive  
Committee**  
Representative William E.  
Sandifer, *South Carolina*



**Chair, SLC Energy & Environment Committee**  
Representative Lynn Smith, *Georgia\**



**Secretary**  
Kenneth J. Nemeth, *Executive Director, SSEB\**

*\*Ex-Officio, Non-Voting Executive Committee Members*



# Members of the Board

## Alabama

The Honorable Kay Ivey  
Governor

Sen. Jimmy Holley

Sen. Cam Ward (Alternate)

Rep. Randy Davis

Rep. Howard Sanderford (Alternate)

## Arkansas

The Honorable Asa Hutchinson  
Governor

Sen. Eddie Joe Williams

Sen. Bruce Maloch (Alternate)

Rep. Ken Henderson

Commissioner Ted Thomas  
(Governor’s Alternate)

Katie Beck (Governor’s Alternate)

## Florida

The Honorable Rick Scott  
Governor

Rep. Mike La Rosa

Kelley Burk (Agriculture  
Commissioner’s Appointee)

## Georgia

The Honorable Nathan Deal  
Governor

Sen. Jeff Mullis

Sen. Rick Jeffares (Alternate)

Rep. Lynn Smith

Rep. Chuck Martin (Alternate)

Lauren Curry (Governor’s Alternate)

## Kentucky

The Honorable Matt Bevin  
Governor

Sen. Brandon Smith

Rep. Jim Gooch, Jr.

Secretary Charles Snavelly (Governor’s  
Alternate)

## Louisiana

The Honorable John Bel Edwards  
Governor

Sen. Dan Claitor

Sen. Gerald Long (Alternate)

Rep. Raymond Garofalo, Jr.

Rep. Blake Miguez (Alternate)

Robert Adley (Governor’s Alternate)

## Maryland

The Honorable Larry Hogan  
Governor

Sen. Thomas Middleton

Sen. Katherine Klausmeier (Alternate)

Del. Dereck Davis

Del. Sally Jameson (Alternate)

Dr. Mary Beth Tung (Governor’s  
Alternate)

## Mississippi

The Honorable Phil Bryant  
Governor

Sen. Terry Burton

Sen. Sean Tindell (Alternate)

Rep. Gary Staples

Rep. Angela Cockerham (Alternate)

Alice Perry (Governor’s Alternate)

## Missouri

The Honorable Eric Greitens  
Governor

Sen. Ryan Silvey

Sen. Jeanie Riddle (Alternate)

Rep. Rocky Miller

Rep. Tim Remole (Alternate)

Todd Scott (Governor’s Alternate)

## North Carolina

The Honorable Roy Cooper  
Governor

Sen. Trudy Wade (Alternate)

Rep. John Szoka

Rep. Dean Arp (Alternate)

## Oklahoma

The Honorable Mary Fallin  
Governor

Sen. A.J. Griffin (Alternate)

Rep. Weldon Watson

Rep. Charles Ortega (Alternate)

Secretary Michael Teague (Governor’s  
Alternate)

## Puerto Rico

The Honorable Ricardo Rosselló  
Governor

Sen. Zoé Laboy Alvarado

Sen. Miguel Laureano Correa  
(Alternate)

Rep. Victor Parés Otero

**South Carolina**

The Honorable Henry McMaster  
Governor

Sen. Lawrence Grooms

Sen. Thomas Alexander (Alternate)

Rep. William Sandifer

**Tennessee**

The Honorable Bill Haslam  
Governor

Sen. Mark Norris

Sen. Ken Yager (Alternate)

Rep. John Ragan

Commissioner Robert Martineau  
(Governor's Alternate)

**Texas**

The Honorable Greg Abbott  
Governor

Sen. Craig Estes

Rep. Drew Darby

Commissioner Christi Craddick  
(Governor's Alternate)

**U.S. Virgin Islands**

The Honorable Kenneth Mapp  
Governor

**Virginia**

The Honorable Terry McAuliffe  
Governor

Sen. Frank Wagner

Sen. John Edwards (Alternate)

Sen. John Cosgrove (Alternate)

Del. James W. (Will) Morefield

Del. Charles Poindexter (Alternate)

Del. Israel O'Quinn (Alternate)

Hayes Framme (Governor's Alternate)

**West Virginia**

The Honorable Jim Justice  
Governor

Sen. Randy Smith

Sen. Dave Sypolt (Alternate)

*\*Board roster current as of Sept. 1, 2017*

## Staff

**Kenneth J. Nemeth**

Executive Director and Secretary to the Board

[nemeth@sseb.org](mailto:nemeth@sseb.org)

**Patricia A. Berry**

Geologist

[berry@sseb.org](mailto:berry@sseb.org)

**Joan T. Brown**

Senior Accounting Specialist

[brown@sseb.org](mailto:brown@sseb.org)

**Turney Foshee**

Design and Communications Specialist

[foshee@sseb.org](mailto:foshee@sseb.org)

**Gary P. Garrett**

Senior Technical Analyst

[garrett@sseb.org](mailto:garrett@sseb.org)

**Kimberly Sams Gray**

Managing Director

[gray@sseb.org](mailto:gray@sseb.org)

**Leigh T. Parson**

Grants and Accounting Specialist

[parson@sseb.org](mailto:parson@sseb.org)

**Kathy A. Sammons**

Director, Business Operations

[sammons@sseb.org](mailto:sammons@sseb.org)

**Rebecca R. Stavely**

Staff Assistant

[stavely@sseb.org](mailto:stavely@sseb.org)

**Michelle D. Thornton, CMP**

Event Planner

[thornton@sseb.org](mailto:thornton@sseb.org)

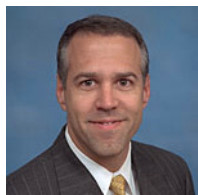
**Christopher U. Wells**

Assistant Director, Nuclear Programs

[wells@sseb.org](mailto:wells@sseb.org)

# Associate Members

## 2016-2017 Officers



### **Chairman**

William M. Droze  
Troutman Sanders, LLP



### **Vice Chairman**

Dave Cagnolatti  
Phillips 66



### **2<sup>nd</sup> Vice Chairman**

George Guidry  
Koch Companies Public  
Sector, LLC



### **Immediate Past Chairman**

Rudy Underwood American  
Chemistry Council

SSEB's Associate Members program is composed of industry partners that serve in an advisory capacity to the Board Members. Membership includes organizations from the non-governmental sector, corporations, trade associations, and public advocacy groups. The program provides an opportunity for public officials and industry representatives to exchange ideas, define objectives, and advance energy and environmental planning to improve and enhance the quality of life in the South.

- Ameren Missouri
- American Chemistry Council
- American Coalition for Clean Coal Electricity
- American Electric Power
- American Fuel & Petrochemical Manufacturers
- American Gas Association
- American Petroleum Institute
- Carbon Utilization Research Council
- Charah, Inc.
- Chevron Corporation
- Coalition for Fair Energy Codes
- Cooperative Energy
- Dominion Energy
- Duke Energy
- Edison Electric Institute
- Energy Policy Network
- Exxon Mobil Corporation
- INTUS, Inc.
- Koch Companies Public Sector, LLC
- Marathon Petroleum Corporation
- National Coal Council
- National Mining Association
- National Rural Electric Cooperative Association
- Nuclear Energy Institute
- NuScale Power, LLC
- Peabody Energy
- Phillips 66
- SCANA Corporation
- Shell Oil Company
- South Carolina Public Service Authority/Santee Cooper
- Southern Company
- TECO Services, Inc.
- Tennessee Valley Authority
- Troutman Sanders, LLP
- Virginia Center for Coal & Energy Research
- Virginia Coal and Energy Alliance
- West Virginia University



# Notes

# Notes



Alabama • Arkansas • Florida • Georgia • Kentucky • Louisiana  
Maryland • Mississippi • Missouri • North Carolina  
Oklahoma • Puerto Rico • South Carolina • Tennessee • Texas  
U.S. Virgin Islands • Virginia • West Virginia